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THE GENUS PHYLLODINUS AND ITS ALLIES (HOMOPTERA-FULGORIDAE)

Including the Description of a New Genus and Species

By E. D. Ball

The writer recently collected a new and very interesting species of brachypterous Fulgorid with foliaceous tibiae that was evidently closely related to some members of the genus *Phyllodinus*. On reviewing the group preparatory to describing the species it was found that the other species that have been referred to this genus were, in a number of important characters, quite distinct from *P. nervatus*, the type. In the present paper these two groups have been separated, a new genus and species described and the synonomy and distribution of all the species concerned brought as nearly up to date as the material at hand would permit.

Genus **Phyllodinus** Van Duzee

Resembling *Dicranotropis* but with expanded tibiae and with more longitudinal nervures in the apical portions of the elytra. Head broader than the thorax, vertex nearly square, rounding to the front. Front very broad, slightly angularly expanded below the eyes; median carina forked opposite the eyes. Basal joint of the antennae long, slender, almost equalling the second. Lateral carinae of the pronotum following the contour of the eyes. Anterior and middle tibiae and femora flattened—foliaceous. Brachypterous elytra much longer than wide, covering about half of the abdomen. Nervures sharply distinct, numerous. Macropterous elytra broadening apically with 8 terminal nervures.

The type and only species of this genus as here defined is *P. nervatus* Van Duzee.

Phyllodinus nervatus Van Duzee

Eurysa nervata Van Duzee Bull. Buff. Soc. N. Sc. 5 p. 191. 1894.

Resembling *Pissonotus brunneus* but larger, with longer elytra and expanded tibiae. Length 2½-3 mm.

Vertex about square, front very broad, broader than the eye; almost parallel margined. Femora and tibiae almost equally foliaceous through-

out. Brachypterous elytra covering the 5th abdominal segment. Macropterous elytra very broad, the radius forked at least twice before the cross nervures. Back of the cross nervures about 8 apical nervures some of which may fork or join.

Color:—Front dark the margins and a number of transverse bands light. Vertex pronotum and scutellum pale. The median fovae of vertex, a pair of crescentic spots on the pronotum behind the eyes, a triangular pair behind them on the scutellum, separated by a pair of narrow stripes, dark. Brachypterous elytra smoky, the nervures definitely light. Abdomen testaceous brown the apex light. Clypeus and expanded legs black or dark smoky.

This species appears to be restricted to Southern Canada and the extreme northern border of the U. S., coming south only in the higher mountains. It was described from N. Y. and Ontario and the writer has taken examples in Logan Canyon, Utah in the Wasatch Mountains, in the Rocky Mountains back of Fort Collins, Colorado, in Rhinelander in Northern Wisconsin, Hardwick in the Green Mountains of northern Vermont and has examples from Franconia, N. H. (Slosson) taken in the White Mountains. All but one of these examples were taken between the 10th and the 30th of July and all were from very wet and often partially shaded meadows.

Genus **Phyllodictus** gen. nov.

Resembling *Pissonotus* in size and form but with expanded tibiae as in *Phyllodinus*. Head definitely narrower than the thorax, the vertex narrower than the long diameter of the eye. Front somewhat broader than long. The carinae of the vertex and front as in *Pissonotus*. Lateral carinae of the pronotum straight, divergent, becoming obsolete before the posterior margin. Middle and anterior femora and tibiae expanded, the anterior tibiae broad and foliaceous, sometimes as broad as the front. Brachypterous elytra short, as wide or wider than long. Venation reticulate or obscure. Macropterous elytra hyaline, venation simple as in *Pissonotus* not more than 5 apical veinlets.

Type of the genus *P. tessellatus* n. sp.

Muir recently called attention to the two groups and their relation to *Dicranotropis* and *Pissonotus* but to the writer the differences in width of head and direction of pronotal carinae, although undoubtedly distinctive, do not represent as great a divergence as the remarkable complexity of venation and the difference in the place of abbreviation of the brachypterous elytra as exhibited in *P. nervatus*, as compareed with either *Pissonotus* or *Phyllodictus*.

KEY TO THE SPECIES OF PHYLLODICTUS

A.—Brachypterous elytra tessellate. Venation reticulate. First antennal joint as broad as long. 1—*tessellatus* n. sp.

AA.—Brachypterous elytra polished, venation obscure, not reticulate.

B.—Front with narrow transverse white bands above the broad apical one. Oblique white bands on pronotum and elytra. —2—*flabellatus* Ball.

BB.—Front highly polished, unicolorous. Narrow transverse white bands on pronotum and elytra. 3—*nitens* Van D.

Phyllodictus tessellatus n. sp.

Superficially resembling *Phyllodinus nervatus* but smaller with shorter elytra and strikingly different venation. Brownish, heavily tessellated above with pale, except for the abdomen. Length 2mm.

Head narrow, vertex longer than wide, about equalling the pronotum, rounding over to the broad retreating front; carinae obscure, the fork long and narrow. Front very broad, almost square, weakly tricarinate. Clypeus tumid. Pronotum broad, parallel margined, the lateral carinae with one or two short spurs on the inner margins. First joint of antennae short, as broad as long, second joint three or more times the first in length. Brachypterous elytra narrow covering the second segment, closely and evenly reticulate. Macropterous elytra with simple venation as in *flabellatus* except that all the main veins are forked and there may be a few faint reticulations in this region.

Color.—Vertex, pronotum, scutellum and elytra white, irrorate and tessellate with brown. Abdomen brown with a few pale lines. Vertex with a brown band on the anterior margin and a pair of black spots at base, a larger pair on pronotum. Front shining brown, clypeus pitchy, a broad white band on suture. Antennae and anterior legs brown. Macropterous elytra transparent the nervures covered with setigerous black dots and there is a black spot before the apex of clavus.

Type female, allotype male and 9 paratypes collected in low wet "flat woods" at Sanford, Fla. by the writer and one paratype female taken at Meridian, Miss. (Drake.)

Phyllodictus flabellatus Ball

Phyllodinus flabellatus Ball Can. Ent. 34 p. 232 1902.
Phyllodinus koebelei Osb. Ohio Nat. 4 p. 46 1903.
Phyllodinus fuscous Osb. Ohio Nat. 4 p. 46 1903.
Pissonotus piceus Spooner Can. Ent. 44 p. 238 1912.

Large, dark brown, shining with white bands on face, pronotum and elytra. Length 2.5-3mm. Vertex and face narrow, almost parallel margined, pitchy, transversely banded with white. Anterior half of pronotum black, posterior half and scutellum obliquely white. Elytra testaceous or black, shining, the posterior margin sharply and slightly obliquely white, Abdomen brown with narrow longitudinal white flecks. Clypeus black. Anterior tibiae expanded more than femora. Macropterous elytra pale with a dark commisural spot; five apical nervures.

This species which superficially resembles *Pissonotus marginatus* is found in similar situations in moist meadows or the margins of swamps. It has been taken in Ohio (Osb.) Pa. (Wirtner), N. Y. (Spooner), N. J., D. C. (Heid) (Ball), Prairie, Miss. (Drake) and Sanford, Fla. (Ball). All the specimens examined have been taken in July or September.

The writer is very certain that the above synonomy will be found to be correct. Osborn described his species before seeing the description of *flabellatus*. The examples of *fuscous* examined have all appeared to be immature. With more material it may be possible to set off a light colored variety for which the name *fuscous* may be used. Spooner apparently did not know that in *flabellatus* and its allies the pronotal carinae are straight and so placed it in the genus *Pissonotus* and described it as new at the same time noting its affinities with *Phyllodinus*.

Phyllodictus nitens Van Duzee

Phyllodinus nitens Van Duzee Bull. Buff. Soc. N. Sc. 9 p. 198, 1909.

Resembling *flabellatus* but smaller with a unicolorous front and greatly enlarged anterior tibiae. Length 2.5mm. Head much narrower than the thorax; vertex small, quadrate; front rather broad, curved, highly polished. Brachypterous elytra very short, quadrate, highly polished. Anterior tibiae much broader than the femora, as wide or wider than the front. Color variable rufous or rufo-piceous shading almost to black on abdomen, face and anterior tibiae. A narrow transverse white band on posterior margin of pronotum and again on elytra. No light band on face.

Van Duzee described this species from two females, one macropterous, from Southern Florida. The writer has taken two pair of brachypterous forms in low "flat woods" and swamp margins at Sanford and New Smyrna, Fla. Although varying from very pale to almost black in color this pretty species can be recognized by the extraordinary size of its anterior tibiae and the narrow and strictly transverse dorsal white bands.

Mr. T. E. Halloway, of the U. S. Entomological Laboratory in New Orleans, is spending several weeks in Florida. He is stationed at West Palm Beach and Canal Point where he is attempting to establish a Tachinid parasite of the cane borer which is being imported from Cuba. The Experiment Station is also attempting to establish these parasites in Florida in cooperation with County Agent Leo Wilson of Manatee County.

ECOLOGICAL AND GEOGRAPHICAL DISTRIBUTION OF THYSANOPTERA OF FLORIDA

J. R. WATSON*

Thysanoptera form a more important part of the fauna of Florida than of more northern states. One species especially *(Frankliniella tritici bispinosa)* swarms in practically all blossoms, especially during the drier months. Of the 80 odd species recorded from Florida the food habits of 75 are fairly well known. 65 are plant feeders, and 12 mostly predators. However, the distinction between plant feeders and predators is not always very sharp among the thysanoptera. Some of our most abundant plant feeders, for instance, *F. tritici bispinosa*, are occasionally predaceous.

Shull has classified thysanoptera into interstitial, that is, those living in hidden situations, and superficial, those living exposed. The interstitial he has further classified as Anthophilous, those living in flowers, and Phloeophilous, those living under bark; and the superficial into Poephilous, those living on grass, and Phyllophilous, those living on leaves.

However, 7 of our Poephilous species are by choice interstitial, living under sheath of leaves and other sheltered situations, two Phyllophilous species also are interstitial, living among pine needles, and another interstitial species lives under the cap scales of coconuts. The predaceous species may be either interstitial or superficial.

Of the plant feeders 34 are phyllophilous, feeders on leaves and tender shoots. 14 of these are poephilous, preeminently grass insects altho occasionally found on leaves of other plants. They are

Chirothrips manicatus
Chirothrips floridensis
Chirothrips crassus
Limothrips cerealum
Sericothrips singularis
Plesiothrips perplexus
Anaphothrips grandioculus
Bregmatothrips gracilis
Hoplandrothrips pergandei
Haplothrips leucanthemi
Haplothrips bellus
Haplothrips graminis
Eurythrips osborni
Frankliniella fuscus

19 are phyllophilus, that is, feeders on the leaves and shoots of plants other than grasses. Nine of these

Sericothrips variabilis
Echinothrips americana
Heliothrips haemorrhoidalis
Heliothrips phaseoli
Odontothrips phaleratus
Heliothrips fasciatus
Heliothrips femoralis
Liothrips citricornis
Trichothrips amplipennis

*Paper read before the Ecological Society of America at the Cincinnati meeting Dec. 1923.

are general feeders found on a large number of hosts, and nine

Thrips tabaci, on onions and carnations
Mycterothrips floridensis, on velvet beans (Stizilobium sp.)
Liothrips caryae and var., on hickories and pecan.
Oedaleothrips querci, on oaks.
Haplothrips pini, on pines.
Treherniella orlando, on oaks.
Gynaikothrips uzeli, on *Ficus sp.*
Cryptothrips floridensis, on twigs, buds and berries of Camphor.
Cryptothrips laureli, in similar situations on bays. (Tamala sp.)

are confined to, or show a marked preference for, one or a few hosts.

Fourteen species (not including predators) are anthophilous, showing a marked preference for the blossoms of flowers. Nine of these:

Frankliniella cephalica masoni
Frankliniella tritici
Frankliniella tritici bispinosa
Frankliniella occidentalis
Frankliniella stylosa
Frankliniella insularis
Pseudothrips inequalis
Haplothrips gowdeyi
Haplothrips humilis

are general feeders to be found in a large number of blossoms; and five

Heterothrips aesculi, *Aesculus pavia* and *Azalea nudiflora.*
Thrips abdominalis, *Compositae.*
Thrips spinosus, *Magnolia* sp.
Bagnelliella yuccae, *Yucca.*
Neoheegeria verbasci, *Verbascum* sp.

are confined to, or show a marked preference for one or two species, genera, or a single family. Eight species (not including predators)

Merothrips morgani
Phloeothrips floridensis
Hoplandrothrips funebris
Gnophothrips megaceps
Haplothrips citri
Haplothrips funki
Trichothrips terminalis
Barythrips sculpticauda

have always been found under the bark of trees, feeding largely on dead wood or fungi. One has been found only on dried leaves on the forest floor.

What are the factors which determine the ecological distribution of thysanoptera? In the case of those which feed on a single species or genus of plants it would appear to be a question of food; viz. the mullein thrips and Cuban laurel thrips, and many poephilous species. But with the larger number that feed on many species of plants it would seem that the botanical relationships of the hosts have very little to do with the selection. In other words most thysanoptera are poor systematic botanists. The physical characteristics of the plants or blossoms seem much more important and especially the presence

of situations that satisfy the positive sterotropism of interstitial species. Less important are the light reactions, for as Shull first showed for one species, probably all interstitial species are strongly positive stereotropic. A few examples will suffice. Our common flower thrips *(F. tritici bispinosa)* is found in practically all blossoms but shows a decided preference for those affording good opportunities for concealment, or to be more exact, situations which satisfy their positive stereoptropism. Their first choice is among the petals and stamens of roses. The blossoms of tomatoes and other nightshades where they can crowd down between the column of stamens and the pistil is a favorite situation as is also the similar situation in citrus blossoms where they sometimes swarm. I have counted 400 in a single orange blossom. Wisteria, and other blossoms having a narrow, dry tube are great favorites. On the other hand, wide trumpet or bell-shaped blossoms, like *Tecoma*, are largely avoided, as are also those with a copious flow of nectar. This comparative avoidance of wide open bells is instructive. As rains are one of the most destructive factors in keeping down the numbers of this thrips it might seem that the insects seek shelter in tubular blossoms from possible showers. But a pendant bell ought to furnish the best of shelters from rain. Still the thrips are rare there, showing, it seems to me, that the stereotropic reaction is the strong force which retains them in certain blossoms. This species is by no means confined to blossoms. It is sometimes very destructive to unfolding leaf buds of pears and peaches, cowpeas, beans and especially peanuts. One strain of peanuts is particularly liable to damage. It has a somewhat more compact leaf bud than most peanuts.

Another interesting species in this connection is Heterothrips aesculi, which is found in abundance in the blossoms of the southern buckeye, *Aesculus pavia,* and those of *Azalea nudiflora* two plants not at all closely related but having similar blossoms, very long, narrow, dry tubes. It may be significant that these two plants grow in similar ecological situations, open woods in alluvial soil along streams. But with this possible exception I can find no evidence that the distribution of thysanoptera corresponds in the least with ecological formations or societies as recognized by ecologists. The same grass inhabiting species for instance, will occur in open places in our hammocks,

in the piney flat woods, in the swamps, or the sand dunes along the coast, altho the grass hosts may be quite different.

It would seem that it is possible for a species of thrips to be crowded out of an otherwise favorable situation by the presence of another species. For instance, in the north, *Frankliniella tritici* is reported to be particularly abundant among the flowerets of the compositae. In Florida, its variety bispinosa at least, is comparatively rare in the heads of compositae which usually swarm with *Thrips abdominalis,* a species absent from the north.

The phototropic reactions are sometimes a factor in determining the local distribution of thrips. In contradistinction to the results of Shull in Michigan working with *F. tritici,* I find the var. bispinosa much more abundant on the south side of an exposed orange tree. If the tree is shaded by adjoining ones there is no such difference. Furthermore, they are very rare in the interior of a tree. Oranges from the inner branches very rarely show the characteristic thrips marks.

GEOGRAPHICAL DISTRIBUTION

There are twelve species of West Indian or Central American (Neotropical) thysanoptera found in Florida. Only one, *(Aleurodothrips fasciapennis)* extends beyond the state limits. Two more *(Hindsiana melaleuca* and *Symphyothrips punctatus)* reach central Florida. All three are predaceous. Nine,

Selenothrips rubrocinctus
Franklinella cephalica var.
Franklinella occidentalis
Franklinella stylosa
Franklinella insularis
Hoplandrothrips xanthopoides
Haplothrips gowdeyi
Haplothrips merrilli
Gynaikothrips uzeli

are strictly limited to the tropical life zone of extreme southern Florida. In addition there are four species which belong to this Neotropical fauna that seem to be confined to Florida as far as we now know. Thus there are 15 species which belong to this Neotropical fauna.

What limits their spread north? Only four of them are restricted to food plants not found farther north. Six are general plant feeders and as far as food is concerned could spread to Canada. This is also true of the remaining five which are predaceous. Evidently food is not the usual determining factor. Neither is it the lack of suitable habitats. One species particularly *(F. cephalica* var.) is abundant in south Florida, in all

(Continued on page 27)

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J. R. WATSON.....*Editor*
WILMON NEWELL.....*Associate Editor*
A. N. TISSOT.....*Business Manager*

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DECREASE OF THE CITRUS APHID DURING SUMMER

During the three years that the Citrus aphid has been a special object of study it has been observed that their numbers greatly diminish during the summer. Heretofore this has been ascribed entirely to the ravages of fungus diseases, especially *Empusa*. In this number of the Entomologist Mr. Tissot shows that it is also due in part to the slowing up in growth and breeding during the summer. Mr. Miller and Mr. Thompson working at Lake Alfred have also observed that heavy rains are very destructive, the aphids being knocked off the foliage and pounded to death on the ground. Following a heavy (4 inch) rain at Lake Alfred they could find live aphids only in the curled leaves where they were more or less protected. With these three factors holding them down, 1. *Empusa* and other fungus diseases. 2. Slowing down of the rate of growth and reproduction, and 3. the direct action of heavy rains, it does not seem probable that this aphid will ever become severely epidemic during the summer.

ENTOMOGENOUS FUNGI

There has just come to the editor's desk a copy of "Studies in Entomogenous Fungi, VIII: Notes on Beauveria," by Dr. T. Petch (Trans. British Mycological Society, Vol. X, part IV). Dr. Petch places our chinchbug fungus in this genus. It therefore becomes *Beauveria globulifera* (Speg.) Picard.

SOME OBSERVATIONS ON THE LIFE HISTORY OF THE CITRUS APHID (Aphis Spiraecola Patch)

By A. N. TISSOT

During the fall of 1925 and the winter and spring of 1926 some life history work on the Citrus aphid was conducted by the writer at the Experiment Station at Gainesville. The experiments were conducted wholly out of doors and the results obtained vary somewhat from those previously obtained under insectary conditions. The reason for carrying on the experiments in the open was in order that the aphids might be under as nearly natural conditions as possible. It was also possible to rear a much larger number of aphids here than could have been reared in the insectary. The aphids of which records were kept were caged in cloth bags to prevent them from wandering away and getting lost and also to prevent other aphids from mingling with them and thus destroying the records.

It was found that the time necessary for the nymphs to develop to maturity varied greatly at different times of the year. Likewise the average daily production of young and the total number of young produced showed a wide variation. In November the average development period of 15 individuals was 8.8 days. In March for 32 individuals it was 13 days. During the first half of April it required an average of 7.1 days for 129 individuals to become mature and during the first half of May when development was most rapid the average of 42 aphids was 6.7 days. In November the average number of young produced by 9 individuals was 34 and the average daily production was 2.7. In March the average number of young produced by 9 females was 62.9 with a daily average of 3.9. During April 12 females showed an average production of 70.8 with 4.1 for the average daily production and during the month of May the average number of young produced by 43 females was 40.9 with the daily average 4.1.

The most important factors governing both the rate of development and the rate of reproduction are the condition of growth of the leaves upon which they are feeding and the weather conditions, particularly temperature. When the leaves upon which the aphids are feeding are tender and succulent the aphids grow more rapidly, attain a larger size and give birth to more young than when the leaves are more nearly mature. That temperature is an important factor is evident by comparing the first

half of March with the first half of May. The mean temperature for the period in March was 54.8 degrees and it required on an average 13 days for the nymphs to reach maturity. In the first half of May the mean temperature was 73.2 degrees and only 6.7 days was required on the average for the nymphs to mature. On the other hand if the temperature is too high it retards the development of the nymphs and has a very marked effect upon the number of young produced. Thus during the second half of May when the average maximum temperature was about 90 degrees the average number of young produced by one female dropped to 26.7 while the average for the first half of the month was 55.8 young. It is true that the growth on which the aphids were feeding was more mature during the last half of the month but there was a noticeable decrease in the number of young produced by those females which were located on the few tender shoots remaining. It is not probable that the hot weather kills the aphids outright but the fact that there is such a marked decrease in the production of young and a shortening of the life of the aphids means that there will be a decrease in the severity of the general aphid infestation.

ECOLOGICAL AND GEOGRAPHICAL DISTRIBUTION OF THYSANOPTERA OF FLORIDA

(Continued from page 24)

blossoms where it replaces *F. tritici bispinosa,* occupying the same habitats and with apparently identical habits. The factor may be temperature and especially the absolute winter minimum of a series of years, say a sun-spot cycle. This is apparently a more important factor than the sum total of effective temperatures, and is the one which determines the northward migration of orange and mangrove trees and the velvet bean caterpillar, *Anticarsia gemmatilis.*

With the exception of this neotropical fauna the thysanoptera of North America almost completely ignore Merriams' zones. Of the 80 odd species of thrips in Florida, only five are "native scns" of California or Arizona, which with all but the tip of Florida are placed in the austrial zone, while 17 reach Massachusetts; 31 Maryland, and 5 northern Europe. It is thus seen that the thysanopterous fauna of Florida is much more closely related to that of Massachusetts than to that of California, and as closely related to that of northern Europe.

A NEW HAPLOTHRIPS FROM ABYSSINIA

During March, 1924 the writer received from the U. S. Federal Horticultural Board several specimens of a *Haplothrips* collected by H. Y. Gouldman from sorghum seed from Abyssinia, (F. H. B. No. 49460). As they did not seem to fit the description of any species known to the writer, one was sent to Dr. H. Priesner of Linz, Austria, one of the foremost authorities on European and African Thysanoptera. Dr. Priesner pronounced it to be an undescribed species.

Haplothrips abyssianae *sp. nov.*

Female: General body color an almost uniform chestnut brown (Ridgeway's color standard). Antennal segment 3 and fore tibia and tarsi a trifle lighter; tube darker. Head a trifle longer than broad; cheeks slightly arched, provided with a number of rather long but pale bristles. Vertex rounded, very faintly striate posteriorly. Post-ocular bristles longer than the eyes, but pale, pointed. Frons rounded, protruding considerably between the antennae and partially covering their base, bearing the anterior ocellus at the apex. *Eyes* dark, of medium size, non-protruding, non-pilose. *Ocelli* very large (25 microns in diameter), situated far forward. The posterior pair contiguous with the inner margins of the eyes which are indented to receive them. *Mouth cone* rather long, reaching nearly to the mesosternum.

Antennae about 1.6 times as long as the head; segment 1 short, conical; 2 rather abruptly contracted to a broad, obliquely set peduncle; 3 vase-shaped with a constriction just below the middle; 4 obovoid; 5, oblong ovate; 6 and 7 narrowly cylindrical; 8 conical, broadly joined to 7. Segments 4 to 7 have broad, short peduncles. 8 has a serrate outer margin. Segment 3 is a considerably lighter brown than the others and has a colorless apex, as has also 4. Sense cones rather large, but colorless. Bristle short and colorless.

Prothorax shorter than the head and, including coxae, about twice as wide as long. Each anterior angle is provided with a single, heavy bristle of about the length and color of the postocular bristle, sharp pointed as are all bristles of the body. There are two somewhat heavier bristles on each posterior angle.

Mesothorax wider than the prothorax, sides nearly straight and parallel.

Metathorax somewhat narrower than mesothorax, sides slightly arched.

Legs rather slender. Fore femora considerably enlarged, especially in lateral view. Fore tarsus with a minute tooth.

Wings large and powerful, the membrane of the fore pair reaching the base of the tube; pale yellow, with a chestnut brown area at the extreme base; unusually deeply constricted (to a width of less than half of that near the apex and base) in the middle; except at the base, fringed with long hairs, about 5 (4 to 6) inter-located ones. Three conspicuous, yellowish brown, pointed bristles and two smaller ones on each scale.

Abdomen widest at about segment 5. Tube nearly as long as the head. A pair of terminal bristles nearly as long as the tube, the others much shorter.

Measurements: Total body length 2.1 mm. Head, length .24 mm.; width .22 mm.; prothorax, length .19 mm., width (including coxae) .38 mm.; mesothorax, width .47 mm.; metathorax, width .43 mm.; abdomen, greatest width, .54 mm.; tube, length, .228 mm.; width at base, .09 mm., at apex, .045 mm. Antennae, total length .39 mm.

Segment: ..	1	2	3	4	5	6	7	8
length: ..	37	58	72	75	66	66	57	40
width:	40	35	35	40	35	27	23	17 microns

Male: Very similar to the female, but a trifle smaller, abdomen more narrow and tapering posteriorly from segment 2. Fore femora considerably larger than in the female and the fore tarsal tooth much larger.

Measurements: Total length 2 mm. Head, length .25 mm.; width .214 mm.; prothorax, length .20 mm., width .35 mm.; mesothorax, width .384 mm.; metathorax, width .382 mm.; abdomen, greatest width .43 mm.; tube, length .25 mm., width at base .08 mm., at apex .043 mm. Antennae, total length .36 mm.

Segment: ..	1	2	3	4	5	6	7	8
length: ..	32	61	68	63	63	61	57	40
width:	32	34	34	37	30	24	21	17 microns

Described from five females and one male, taken from sorghum seed from Abyssinia. Type in the author's collection, paratypes in the British Musum and in the collection of Dr. Priesner, Linz, Austria.

The large, deeply constricted wings, long tube, and narrow, cylindrical shape of antennal segments 6 and 7, and to a lesser degree 5, and the large ocelli are characters of this species that command attention.

MEETING OF THE SOCIETY

The regular meeting of the Florida Entomological Society was held in Science Hall, May 14, 1926, with vice-president Grossman in the chair. The following members were present: Dr. M. D. Leonard, visiting member, and Berger, Bratley, Goodwin, Grossman, Hubbell, Merrill, Montgomery, Tissot and Watson. Mr. Goode and Mr. Brown were visitors.

The paper of the afternoon was given by Dr. Leonard, of the Florida Agricultural Supply Co., on his experiences in Spain with the Mediterranean Fruit Fly. He brought out the fact that this insect increases in numbers during an unusually wet season. Since a wet season in Spain is much drier than any season in Florida, one can imagine the damage this pest would do if it ever should gain a foothold in Florida. Interest was added to the talk by an excellent series of lantern slides.

H. E. BRATLEY, Secretary.

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50-lb. drum	6.75
100-lb. drum	12.75

"BLACK LEAF"-F2-NICOTINE DUST

Contains Over 2% of Actual ("Free") Nicotine

Is stronger in nicotine than our—F1—Dust, but otherwise, is the same. Recommended against the more resistant insects, such as cucumber beetle, pea aphis, etc.

PRICES

F. O. B. Richmond, Va.

5-lb. tin	$ 1.30
25-lb. drum	4.75
50-lb. drum	8.75
100-lb. drum	16.75

"Black Leaf" products are sold by seedsmen, hardware stores, drum stores, general merchants, and dealers in horticultural supplies.

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Now is the time to spray trees affected with rust mite, scab or melanose. We handle the

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It saves freight on water and expense of handling. Shipped in air-tight packages with removable top. Will keep indefinitely if top is replaced after using. Dissolves readily in any water. Add Dry Lime Sulphur to water and stir. Five pounds to one hundred gallons water for rust mite, equivalent to two gallons 33° Lime Sulphur Solution to one hundred gallons of water. Prices range from 10½ to 25c per pound according to quantity order.

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The newly produced chemical dust is being used the world over to control insect and rodent pests. New uses are being reported continually.

Calcium Cyanide has the unique property of giving off the killing agent—hydrocyanic acid gas—on contact with the moisture in the air. Hydrocyanic acid gas is a powerful insecticide. The dust is simply applied and the moisture in the air finishes the job.

Calcium Cyanide is recommended to control gophers, salamanders, turtles, land crabs, ants, chinch bugs, rats, nematodes, grubs, moles, citrus aphis, besides numerous other pests in many parts of the world.

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